

# **A BRIEF LOOK AT RESTORATION EFFORTS, SENEY NATIONAL WILDLIFE REFUGE SENEY, MICHIGAN**

**R. Gregory Corace, III (Forester) and Michael G. Tansy (Biologist)**

## **Background**

Throughout the National Wildlife Refuge System, ecological restoration efforts have increased in number and scope. A shift in management focus is in part due to the National Wildlife Refuge System Improvement Act of 1997. This legislation directed the Secretary of the Interior to “ensure that the biological integrity, diversity, and environmental health of the System are maintained for the benefit of present and future generations of Americans.”

To comply with the Act, the U. S. Fish and Wildlife Service enacted policies that make reference to restoring “lost or severely degraded elements of integrity, diversity, (and) environmental health at the refuge scale” and favoring “management that restores or mimics natural ecosystem processes of function to achieve refuge purposes.” In total, policy identified “the highest measure of biological integrity, diversity, and environmental health (as)...those intact and self-sustaining habitats and wildlife populations that existed during historic conditions.”

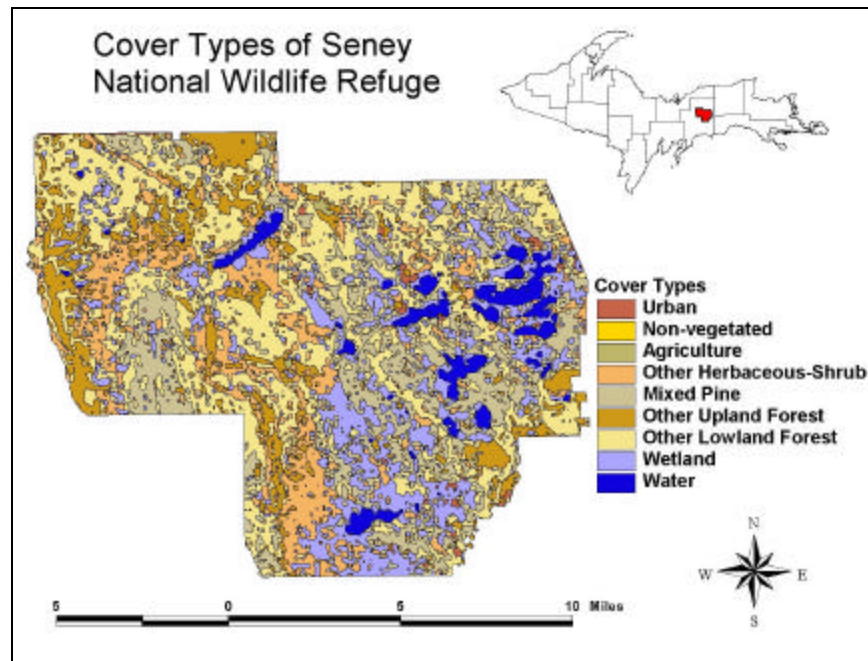
What then is ecological restoration? According to Wagner et al. (2000), “ecological restoration entails negotiating the best possible outcome for a specific site based on ecological knowledge and the diverse perspectives of interested stakeholders.” Martinez (2002) quotes the official Society for Ecological Restoration’s definition: “Ecological restoration is the process of assisting the recovery and management of ecological integrity.....(including) a critical range of variability in biodiversity, ecological processes and structures, regional and historical context, and sustainable cultural practices.” What links these two definitions is that ecological restoration activities go beyond a single commodity, species, or population, and deal with community or ecosystem-level patterns and processes.

Located in the east-central portion of Michigan's Upper Peninsula equidistant from Lake Superior and Lake Michigan, Seney National Wildlife Refuge was established in 1935 for the protection and production of migratory birds and other wildlife by Executive Order under the Migratory Bird Conservation Act. Before establishment as a Refuge, the forests and soils of the Great Manistique Swamp (the area now encompassed by the Refuge) were exploited beginning in the late 1800's. Early timber cutting focused on the best stands of white pine, followed by removal of red pine and northern hardwoods. As the sawtimber resource was depleted, efforts were shifted to cutting of poles, posts, ties and pulpwood. This

gave way to slash fires fueled by logging debris, with most areas burned repeatedly.

By 1912, drainage of the “Seney Swamp” was underway under the auspices of agricultural land development. However, imperfect drainage of peat soils, poor soil fertility, and a short growing season made the farming ventures a disaster. Most lands were tax-reverted to the State of Michigan by the early 1930's.

The Refuge now encompasses 95,238 acres, 25,150 of which comprise the Seney Wilderness Area and the Strangmoor Bog National Natural Landmark. The mosaic of upland and wetland habitat types provides for a diversity of both migratory and non-migratory wildlife species (Fig. 1). Approximately 20 species of herptofauna, 48 species of mammals, 26 species of fish, and over 200 species of birds have been documented within the Refuge.



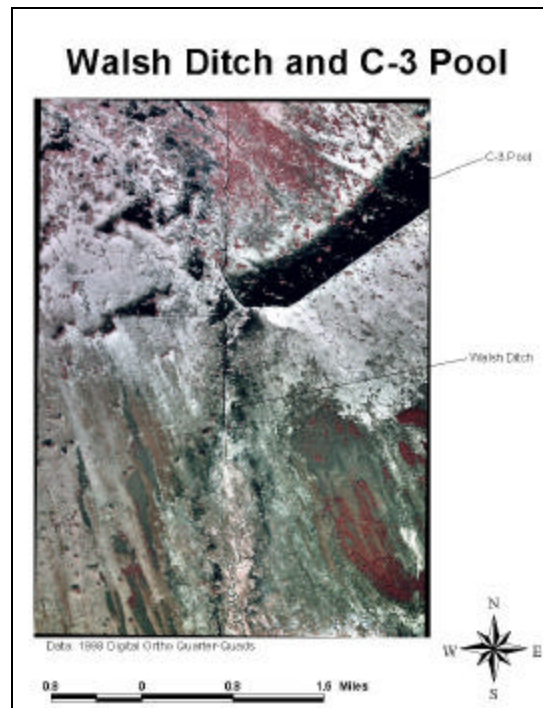
**Figure 1. Vegetation of Seney National Wildlife Refuge.**

### **Riparian Restoration**

Recently, a large-scale riparian restoration project was initiated. The project's goal is to restore the hydrology and ecological integrity of the wetlands and streams that have been affected by the alterations of historic flows of three streams and the creation of the Walsh Ditch. Imbedded within this objective is a need to maintain the water levels in the C-3 Pool and thus provide habitat for Bald Eagles, Osprey, and numerous other wetland-dependent species.

Created in 1915, the Walsh Ditch drains wetlands for a total of 16 linear miles, six of which are located within the Seney Wilderness Area. Negative impacts of the

Ditch include lower groundwater levels, altered vegetation communities, oxidized peat soils, altered natural cycle of flooding, increased erosion, increased sedimentation of the Manistique River downstream, and reduced plant species richness, productivity, and diversity along the historic riparian zones (Fig. 2).



**Figure 2. Walsh Ditch south of C-3 Pool.**

Restoration will return the historic flow of water to channels of the Driggs River, Marsh Creek, and Walsh Creek while reducing the effects of the Walsh Ditch. To effect this change, large-scale water control structures are being installed that will allow water to be re-diverted. Ditch plugs will then be placed in the Walsh Ditch. These plugs, as well as future beaver activity, will reduce the lateral flow of ground water into the Ditch and therefore retard the loss of groundwater and resulting erosion.

### **Forest Restoration**

The goal of forest restoration is to reestablish structure and composition to forested ecosystems adversely affected by past logging operations. Historically, mixed upland conifer stands of red and white pine in the area were maintained by periodic fire. When these areas were subjected to high-grade logging, or to the removal of only the largest and healthiest trees, the composition and structure of the stands were altered. Slash produced by this extensive logging then burned and converted these areas to "pine stump fields." Now, many of these areas

consist of pole to sawtimber-sized stumps interspersed by primarily jack pine. However, due to local effects considerable structural differences are found between sites; some are relatively well-stocked, while others are more savannah-like in appearance (Figs. 3, 4). Overall, however, the jack pine component has displaced red and white pine, and mean stand diameter has been reduced.



**Figure 3. Pine stump field with little regeneration.**



**Figure 4. Pine stump field with moderate regeneration.**

Since forests growing on xeric soils in the region are quite dynamic, our restoration work acknowledges that a continuum naturally exists with respect to composition and structure. Proceeding from this standpoint, we propose to first map the sites, collect soil information, and then proceed with active management. In one scenario, restoration might begin by conducting timber harvests to remove larger jack pines, thereby “releasing” red and white pine seed

trees and scarifying the soil. Prescribed fires to kill jack pine seedlings could then be used to further reduce the jack pine cover. If needed, understory planting of red and white pine could follow the prescribed fire.

Overall, this work will promote the longer-lived red and white pine and reduce overall jack pine coverage, thereby restoring historic stand structure and composition. Work will produce mixed stands of red, white, and jack pine of varying density and size distribution and provide improved foraging for Red Crossbills, Bohemian Waxwings, Pine Grosbeaks, and other seed-eating winter migrants.

### **Restoration and Research**

An important aspect of restoration is the development of a program to assess and monitor management actions (Egan 2002). Although a number of restoration-minded research programs exist in grassland-dominated regions, less work has been done in mostly forested ecosystems. Consequently, Refuge staff are attempting to coordinate activities with interested academic institutions. The hope is that monitoring programs are devised in such a way as to allow for the testing of hypotheses regarding the underlying mechanisms of restoration as well as the effect of that process upon wildlife and wildlife habitat.

### **Literature Cited**

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For more information, please contact R. Gregory Corace, III (Greg\_Corace@fws.gov) and Michael G. Tansy (Mike\_Tansy@fws.gov). Alternatively, either can be reached at Seney National Wildlife Refuge, 1674 Refuge Entrance Rd., Seney, MI 49883; telephone: 906.586.9851.